DOCKET NO. 075635.0108 (2001P57007US) **PATENT**
FILE NO. UGSC01-05085
CLIENT NO: 45113

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	Feng Yu, et al.
Serial No.	:	10/039,187
Filed	:	December 31, 2001
For	:	APPARATUS, METHOD, AND SYSTEM FOR DRAFTING MULTI-DIMENSIONAL DRAWINGS
Group No.	:	2628
Examiner	:	Roberta D. Prendergast
Conf. No.	:	7183

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

Applicant herewith respectfully submits that the Examiner's decision of July 28, 2009, finally rejecting Claims 24-46 in the present application, should be reversed, in view of the following arguments and authorities. This Brief is submitted subsequent to the Notice of Appeal filed October 23, 2009. The $540 fee for filing a Brief on Appeal is paid herewith, but please charge any additional necessary fees to Deposit Account No. 19-2179.

TABLE OF CONTENTS

Table of Authorities

Cases

Real Party in Interest

The real party in interest, and assignee of this case, is Siemens Product Lifecycle Management Software Inc.

Related Appeals or Interferences

To the best knowledge and belief of the undersigned attorney, there are none.

Status of Claims

Claims 24-46 are under final rejection, and are each appealed. Claims 1-23 were previously cancelled.

Status of Amendments after Final

No claims were amended after the July 28, 2009 final rejection.

Summary of Claimed Subject Matter

The following summary refers to disclosed embodiments and their advantages, but does not delimit any of the claimed inventions.

In General

The present application is directed, in general, to drafting multi-dimensional drawings. *Page 1, lines 4-6.*

Support for Independent Claims

Note that, per 37 CFR 41.37, only each of the independent claims are discussed in this section, as well as any claims including means-plus-function language that is argued separately below. In the arguments below, however, the dependent claims are also discussed and distinguished from the prior art. The discussion of the claims is for illustrative purposes, and is not intended to affect the scope of the claims.

Independent claim 24 describes a method for interfacing with multiple surfaces within a computer-aided drawing environment. The method describes, using a computer system (*e.g., computer system 12 of Figs. 1A and 1B, described on page 6, line 7 – page 7, line 30*), determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition

being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than zero (*e.g., as described on page 4, lines 4-8*). The method also requires, using the computer system, determining that a second surface of a drawing comprises a second plurality of curves constituting a first N x M surface condition, a first N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, where N and M are integers greater than one (*e.g., as described on page 4, lines 9-15*). The method also requires, using the computer system, converting the P x 1 surface condition of the first surface into a second N x M surface condition to match the N x M surface condition of the second surface, the second N x M surface condition being defined by a number of fifth curves equal to N and a number of sixth curves equal to M, wherein N and M are integers greater than one (*e.g., as described on page 18, line 22 – page 19, line 5; page 20, line 24 – page 21, line 6, and illustrated at step 134 of Fig. 3*). The method also requires, using the computer system, constructing an N x M surface under the second N x M surface condition (*e.g., as described on page 4, lines 15-17, and illustrated at step 138 of Fig. 3*). The method also requires modifying the second N x M surface to edit a drawing (*e.g., as described on page 4, lines 17-18*).

Independent claim 30 describes a method for interfacing with a surface within a computer-aided drawing environment. The method requires, using a computing system

(*e.g., computer system 12 of Figs. 1A and 1B, described on page 6, line 7 – page 7, line 30*), determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, where P is an integer greater than one (*e.g., as described on page 4, lines 4-8*). The method also requires, in response to determining that the plurality of curves constitute a P x 1 surface condition and using the computing system, converting the P x 1 surface condition into an N x M surface condition (*e.g., as described on page 18, line 22 – page 19, line 5; page 20, line 24 – page 21, line 6, and illustrated at step 134 of Fig. 3*) by generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface and compatible with the number of first curves and the only one second curve that define the P x 1 surface condition (*e.g., as described on page 19, lines 10-18*), the N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, where N and M are integers greater than one, wherein each of the third and fourth curves are of the same mathematical degree as the first and second curves to be compatible with the first and second curves (*e.g., as described on page 12, lines 23-30*). The method also requires, using the computing system, constructing an N x M surface under the N x M surface condition (*e.g., as described on page 4, lines 15-17, and illustrated at step 138 of Fig. 3*). The method

also requires modifying the N x M surface to edit a drawing (*e.g., as described on page 4, lines 17-18*).

Independent claim 35 describes an apparatus for interfacing with a surface within a computer-aided drawing environment (*e.g., computer system 12 of Figs. 1A and 1B, described on page 6, line 7 – page 7, line 30*). The apparatus includes a software program stored on a computer readable medium and operable, when executed on a processor, to perform various functions (*e.g., drawing application 21 in memory 20 of Fig. 1B, described on page 6, line 26 – page 7, line 30*). The software program, when executing, is operable to determine that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, the P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, where P is an integer greater than zero (*e.g., as described on page 4, lines 4-8*). The software program, when executing, is operable to determine that a second surface of the drawing comprises a second plurality of curves constituting a first N x M surface condition, a first N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, wherein N and M are integers greater than one (*e.g., as described on page 4, lines 9-15*). The software program, when executing, is operable to convert the P x 1 surface condition of the first surface into a second N x M surface condition to match the N x M surface condition of the

second surface, the second N x M surface condition being defined by a number of fifth curves equal to N and a number of sixth curves equal to M, wherein N and M are integers greater than one (*e.g., as described on page 18, line 22 – page 19, line 5; page 20, line 24 – page 21, line 6, and illustrated at step 134 of Fig. 3*). The software program, when executing, is operable to generate an N x M surface under the second N x M surface condition (*e.g., as described on page 4, lines 15-17, and illustrated at step 138 of Fig. 3*). The software program, when executing, is operable to modify the generated N x M surface (*e.g., as described on page 4, lines 17-18*).

Independent claim 41 describes a system for interfacing with a surface within a computer-aided drawing environment (*e.g., computer system 12 of Figs. 1A and 1B, described on page 6, line 7 – page 7, line 30*). The system includes a computer system having a display unit and an input device (*e.g., output device 16 and input devices 14 of Fig. 1A, described on page 6, lines 7-25*). The system also includes a computer readable medium coupled to the computer system, the computer readable medium comprising a software program operable to perform various functions (*e.g., drawing application 21 in memory 20 of Fig. 1B, described on page 6, line 26 – page 7, line 30*). The software program is operable to determine that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, the P x 1 surface condition being defined by a number of first curves equal to P and only one

second curve, wherein P is an integer greater than one (*e.g., as described on page 4, lines 4-8*). The software program is operable to convert the P x 1 surface condition of the first surface into a N x M surface condition, the N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, wherein N and M are integers greater than one (*e.g., as described on page 18, line 22 – page 19, line 5; page 20, line 24 – page 21, line 6, and illustrated at step 134 of Fig. 3*), the third and fourth curves mathematically filling the space of the surface plane defined by the first curves and the only one second curve (*e.g., as described on page 19, lines 10-18*). The software program is operable to construct an N x M surface under the N x M surface condition condition (*e.g., as described on page 4, lines 15-17; on page 12, lines 23-30; and illustrated at step 138 of Fig. 3*). The software program is operable to enable edits to the drawing, at least in part, by enabling modifications to the constructed N x M surface (*e.g., as described on page 4, lines 17-18*).

Grounds of Rejection to be Reviewed on Appeal

1. Are Claims 24-46 unpatentable under § 103(a) over *Maya Unlimited 2.0, User's Guide* in view of U.S. Patent No. 5,619,625 to Konno *et al.*?

ARGUMENT

Stated Grounds of Rejection

The rejections outstanding against the Claims are as follows:

1. In the July 28, 2009 Office Action, Claims 24-46 were rejected as unpatentable under 35 U.S.C. § 103(a) over *Maya Unlimited 2.0, User's Guide* © 1998-1999, 59 pages, hereinafter "Maya" in view of U.S. Patent No. 5,619,625 to Konno *et al.*, hereinafter "Konno".

Legal Standards

In rejecting claims under 35 U.S.C. § 103(a), the examiner bears the initial burden of establishing a *prima facie* case of obviousness. (*In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). See also *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984)). It is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. (*Id.* at 1073, 5 USPQ2d at 1598). In so doing, the examiner is expected to make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), *viz.*, (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art. In addition to these factual determinations, the examiner must also provide "some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." (*In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir 2006) (cited with approval in *KSR Int'l v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007)).

Analysis of Examiner's Rejection

The Examiner's rejections are based on various "teachings" that are not taught or suggested by the cited reference, but which the Examiner claims would be "understood" from the reference.

It is helpful to understand a very simplified process, corresponding to the processes described in the instant application; this description is not intended to limit nor define the claims in any way. As generally described in the specification, a computer-aided drafting (CAD) figure can include surfaces defined in various "surface condition" formats, according to the type and number of curves that describe the basic shape and boundaries of the surface. Some specific formats discussed herein include a Px1 surface condition (one or more curves in combination with a single other curve) and an NxM surface condition (two or more curves in combination with a two or more other curves). These formats are generally inconsistent with each other, and conventional systems imposed significant restrictions on each surface of a drawing based on the surface condition of the surface – some CAD modifications can only be performed on specific types of surfaces. Various embodiments disclosed in the specification, and claimed herein, include methods for a system to convert inconsistent surface conditions and create new surfaces so that some or all of the CAD drawing has a uniform format across multiple surfaces (and performing other processing to

accomplish this and to ensure that the resulting drawing has consistent surfaces). None of the cited art does anything like this.

First Ground of Rejection

Claims 24-46 were rejected as unpatentable under 35 U.S.C. § 103(a) over Maya in view of Konno.

Claims 24 and 35

These independent claims include similar relevant limitations and may be considered together. For the convenience of the Board, Claim 24 is reproduced below:

> 24. A method for interfacing with multiple surfaces within a computer-aided drawing environment, comprising:
>
> using a computer system, determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than zero;
>
> using the computer system, determining that a second surface of a drawing comprises a second plurality of curves constituting a first N x M surface condition, a first N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, wherein N and M are integers greater than one;

using the computer system, converting the P x 1 surface condition of the first surface into a second N x M surface condition to match the N x M surface condition of the second surface, the second N x M surface condition being defined by a number of fifth curves equal to N and a number of sixth curves equal to M, wherein Nand M are integers greater than one;

using the computer system, constructing an N x M surface under the second N x M surface condition; and

modifying the second N x M surface to edit a drawing.

Claim 24 requires "using a computer system, determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than zero".

These limitations are not taught by any combination of Maya and Konno. The Examiner refers to Maya at "Pages 20-21, Extruding surfaces; Pages 21-22, Choosing the extrude style; Page 34, Adding curves to Lofted surfaces; Page 43, Using the Birail 1 Tool". *July 28, 2009 Office Action, page 3.* The Examiner has indicated that the page numbers for Maya used in the final Office Action correspond to the non-printed paging of a PDF file the Examiner generated from printing some web pages from

"caad.arch.ethz.ch" on or about August 12, 2008. For the convenience of the Board, Appellant reproduces some material from Maya herein. Where Appellant reproduces pages, text, or images from Maya herein, they are those portions that Appellant believes corresponds to the portions cited by the Examiner.

"Extruding surfaces" on page 20 shows:

Extruding surfaces

Use Surfaces>Extrude to construct a surface by moving a cross sectional profile curve along a path. Extrude works by sweeping a profile curve. Before you extrude, set the pivot point of each profile curve to specify the relationship between the profile and the path.

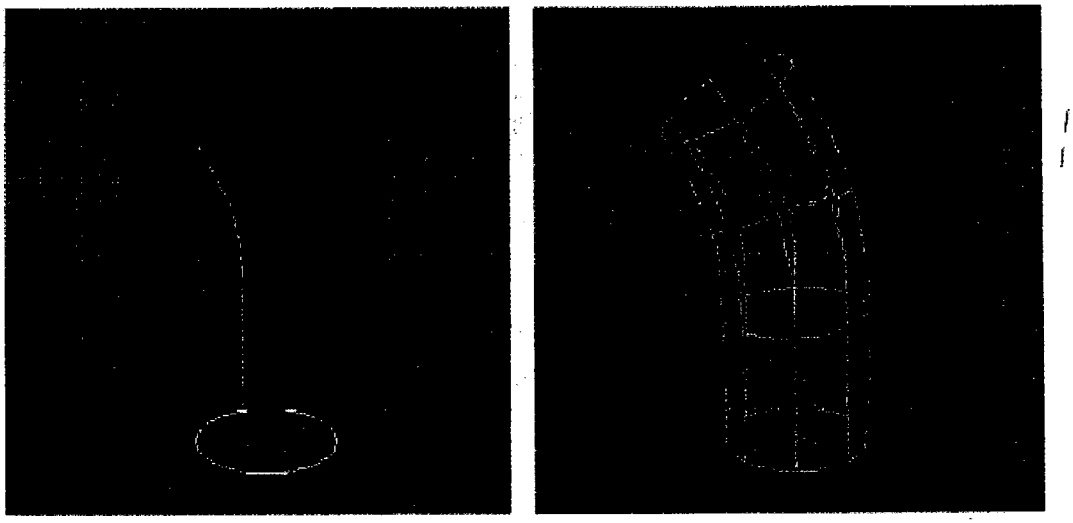
The profile curve, the curve you want to extrude along the path, can be an open or closed free curve. You can also use a surface isoparm, curve-on-surface, or a trim boundary.

To create an extruded surface:

You need at least two curves to create an extruded surface: a *path curve* and a *profile curve*. The profile curve is the curve that gets swept along the path curve to create the surface. The path curve is the last selected curve.

1 **Select the profile curve first, then Shift-select the path curve. The last curve you select (the path curve) displays in the selected default green color.**

2 **Select Surfaces>Extrude.**



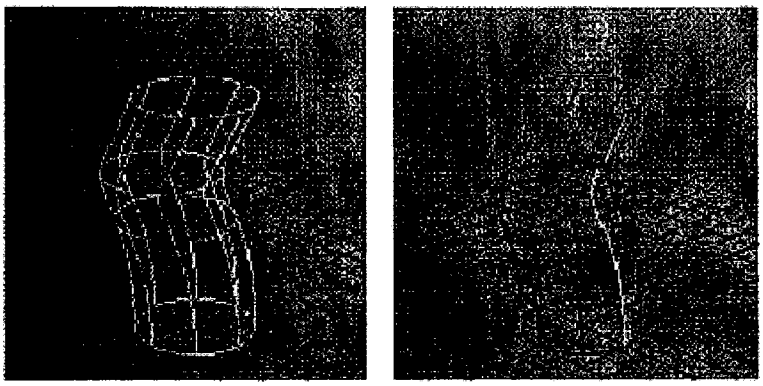
"Choosing the extrude stule on pages 22-23 shows:

Choosing the extrude style

Select a **Style** option to specify the type of extrusion you want. See "Setting the extrude distance" on page 320 for information on the **Distance** option.

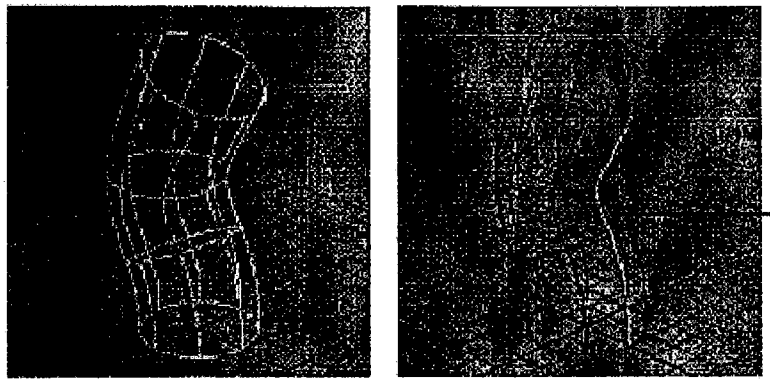
Flat

If you choose the **Flat** option, the extrude maintains the orientation of the cross section in space as it moves along the extrusion path.



Tube

Tube is the default extrude style. It sweeps the cross section along the specified path so that the reference vector stays tangent to the path.



With Tube, the extrusion sweeps along the profile curve and pushes out as it follows the path.

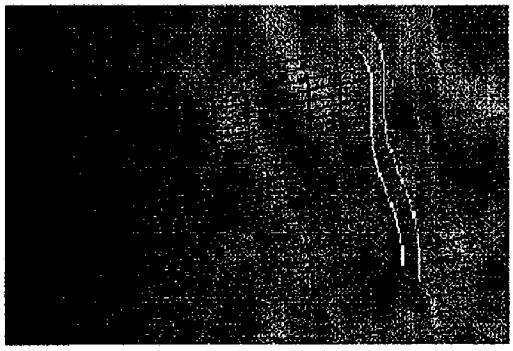
The Examiner's citation of "Adding curves to lofted surfaces" appears to correspond to "To add additional curves to a lofted surface" on page 34, which shows:

To add additional curves to a lofted surface:

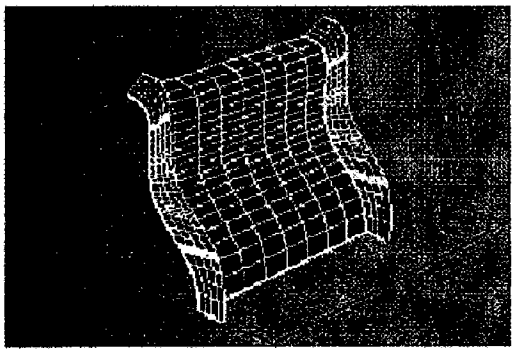
You can add new curves to an existing lofted surface created with construction history.

1 Select one of the curves you used to create the lofted surface. Notice the lofted surface is displayed in the construction history color.

2 Select the curve you want to add, then select **Surfaces>Loft.**



The following shows the result when two curves are added to the initial lofted surface.



"Using the Birail 1 Tool" on page 43 shows:

Using the Birail 1 Tool

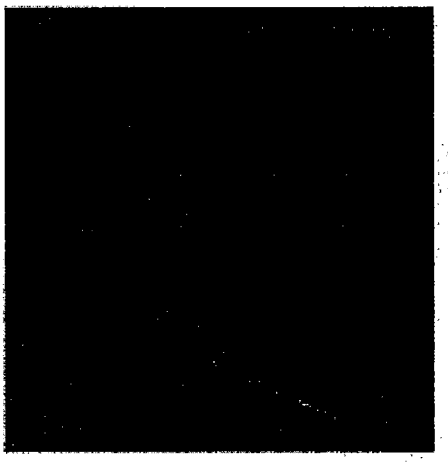
Use the **Surfaces>Birail 1 Tool** to construct a surface by sweeping one profile curve along two rail curves. You can also construct the surface by reversing the selection order of the rail curves.

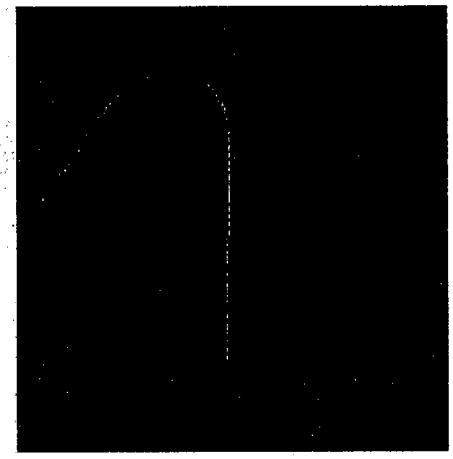
To build a birail surface from a single profile curve:

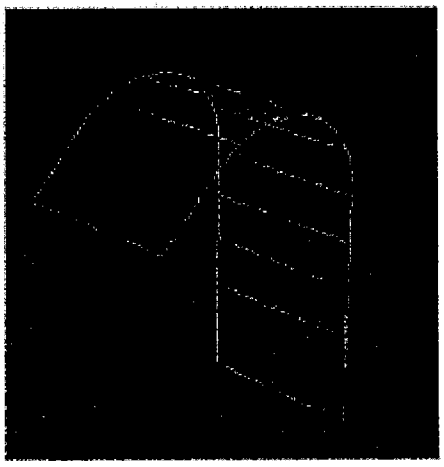
1 Select **Surfaces>Birail 1 Tool.**

2 Follow the prompts at the Help Line. Click the curve you want to use as the profile curve, then click the two rail curves. The surface is displayed in the construction history color by default.

3 Press Enter to complete the birail surface.







Appellant initially notes that Maya is a *user manual*, and describes how a user might interact with a software application. It does not describe how or that the software application itself manipulates any data – such as any curves, surface conditions, or surfaces – or performs any significant processing of the underlying data, such as the claimed conversion between surface conditions.

Nothing in any of these cited portions, nor any other part of the cited art, teaches or suggests by using a computer system, determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than zero, as required by claim 24. Claim 35 specifically requires a software program stored on a computer readable medium and operable, when executed on a processor, to determine that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition.

The first figure reproduced above under "Extruding surfaces" certainly could be viewed as showing a first circular curve and a single second curve, but nothing in the reference suggests that the computer system or executable software program determines that a first surface comprises curves that constitute a Px1 surface condition, as claimed. Except for one figure under "To add additional curves to a lofted surface", none of the figures cited by the Examiner show a surface at all, and there can be no

teaching that any surface is determined to comprise any curves constituting any surface condition. Certainly, nothing in Maya describes at all if any surface in the system is defined by any specific surface condition as that term is defined by the claim. The Examiner merely refers to various of Maya's figures and assumes that some curves may be used to define some (unseen) surfaces, but does not show any teaching in Maya that any surface comprise any curves that constitute a specific surface condition.

The Examiner continues that "it is understood that additional curves may be added/selected such that a first surface having a Px1 surface condition is determined." *July 28, 2009 Office Action, page 3.* This is not supported in the reference, nor are the other statements throughout the rejections that are prefaced with "it is understood'. These "understandings" are not common knowledge, nor supported by any evidence in the record. "It is understood" appears to refer to the Examiner's personal view as of 2009, and has nothing at all to do with the teachings of the references or what was known by those of skill in the art at the time of filing. This is not proper support for any rejection. All such "it is understood" statements are traversed as not meeting any evidentiary requirement for a proper rejection of claims. If the Examiner is relying on personal knowledge to support the finding of what is known in the art, the Examiner was respectfully requested to provide an affidavit or declaration setting forth specific

factual statements and explanation to support the finding, as required by 37 CFR 1.104(d)(2), but has declined to do so.

In the Advisory Action, the Examiner states that the "it is understood" comments are intended "to indicate what one of ordinary skill in the art would reasonably conclude based on the disclosure of the cited references and based on applicant's own disclosure." *October 5, 2009 Advisory Action.* Appellant respectfully notes that the Examiner's statements of what "is understood" are not factually supported in, nor reasonably implied by, any teaching of the cited references. The Examiner also appears to indicate that she is actually attempting to use the teachings of the instant application as part of a prior-art rejection; this is improper unless the Applicant has himself described some teaching in the specification as "prior art", and Applicant has not done so.

In the Advisory Action, with regard to this specific claim limitation, the Examiner also states that "Examiner respectfully submits that Applicants specification teaches wherein a surface is determined to be a Px1 surface or an NxM surface based on the number of section curves and guide curves that, in combination, may define a surface, see pages 9-10, lines 21-3. Those as defined in the specification, Maya teaches determining that a first surface of a drawing constitutes a Px1 surface condition when the surface is defined by P section curves and only 1 guiding curve...." *October*

5, 2009 Advisory Action. Here, the Examiner improperly attempts to impute teachings of the instant application into the Maya reference. The portion of the specification cited by the Examiner describes:

> A method for generating a surface is named based on the surface condition in which the surface was generated. A surface condition refers to the respective numbers of section curves and guide curves that, in combination, may define a surface. In general, a surface condition is expressed in a UxV format, where "U" is the number of section curves and "V" is the number of guide curves. As such, the method used to generate a surface is also expressed in a UxV format. For example, the combination of two section curves 26A and 26B and one guide curve 28, with or without the resulting surface 24, constitutes a 2x1 surface condition. If there were an additional section curve, then that combination constitutes a 3x1 surface condition. *Specification page 9, line 21 – page 10, line 3.*

This portion of the specification indicates that "surface condition" refers to the respective numbers of section curves and guide curves that, in combination, may define a surface. The Examiner appears to attempt to simply show a number of curves, and therefore assert that these are a "surface condition" as described in the specification.

The Examiner ignores the actual limitations of the claims. The Examiner asserts that "it is understood" that additional curves may be added "such that a first surface having a Px1 surface condition is determined." This is not the limitation – this limitation does not discuss determining a surface from curves. The limitation requires that the system determines the opposite – that a surface comprises a first plurality of curves constituting a P x 1 surface condition. The Examiner has made no showing at all that any surface is determined to comprise specific curves or surface conditions. The portions and figures indicated by the Examiner primarily concern adding curves to a wireframe (perhaps so a later surface could be generated), but not examining the surface conditions that define a given surface.

Since none of the cited references are concerned with identifying the various surface conditions that define the surfaces of a drawing, so that one or more of the surfaces can be replaced with surfaces having uniform surface conditions, it is clear that none of the references would address this specific limitation.

Claim 24 also requires, using the computer system, determining that a second surface of a drawing comprises a second plurality of curves constituting a first N x M surface condition, a first N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, wherein N and M are integers greater than one.

The Examiner cites to the same portions of Maya reproduced above. The Examiner then states that "it is understood that additional curves may be added/selected such that a first surface having a Px1 surface condition is determined adjacent to a second NxM surface having a first NxM surface condition...." *July 28, 2009 Office Action, page 4.*

Again, this is simply unsupported in the reference, and doesn't meet the claim limitation. First, Maya does not describe, at all, how any surface is defined by the system, whether by a Px1 surface condition, or an NxM surface condition, or otherwise. There is simply no such teaching, nor would there be in a user manual. As none of this information is described, there can be no implication that adding additional curves would determine any new surface having a specific surface condition.

Further, the Examiner again fails to address the actual claim limitation. The claim does not require that curves are added until a surface is defined, the claim requires that the system determines what kind of surface it is. The claim requires that the system determines that the second surface comprises curves constituting an NxM surface condition. Nothing in Maya teaches anything about determining the surface condition for a given surface.

Claim 24 also requires, using the computer system, converting the P x 1 surface condition of the first surface into a second N x M surface condition to match the N x M

surface condition of the second surface. This is not taught at all in any cited reference, since these surface conditions at all.

The Examiner's rejection states "Page 34, Adding curves to Lofted surfaces; Page 43, Using the Birail 1 Tool, i.e. curves are added adjacent to an NxM lofted surface such that a Px1 surface condition is identified and then an NxM surface is generated adjacent to the existing NxM surface...." *July 28, 2009 Office Action, page 4.*

This is completely unsupported in the cited references. The pages to which the Examiner refers are reproduced above, and it is clear that no surfaces are taught or suggested to be maintained by the system as surfaces defined by NxM surface conditions, no surfaces are taught or suggested to be maintained by the system as surfaces defined by Px1 surface conditions, and there is absolutely no teaching or suggestion that any Px1 surface conditions are converted to NxM surface conditions, as claimed.

The Examiner also indicates "Maya Unlimited 2.0 does not specifically teach wherein converting the Px1 surface condition of the first surface into a second NxM surface condition, wherein the second NxM surface condition is converted to match the NxM surface condition of the second surface as claimed." *July 28, 2009 Office Action, page 5.* The Examiner instead relies on Konno, stating:

> ...column 5, lines 20-29 and 35-48, i.e. the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated thus indicating that a first NxM surface generated adjacent to a second NxM surface would have a NxM surface condition to match the second NxM surface condition of the second surface in order to ensure continuity between the adjacent surfaces. *July 28, 2009 Office Action, pages 5-6.*

The Examiner is incorrect. Konno discusses surface-matching techniques, but does not at any time teach or suggest the surface conditions as defined by the instant claims. Konno does not consider at all different surfaces with different surface conditions. Konno certainly does not convert between one surface condition, as defined by the claims, into another surface condition. There simply is no relevant teaching. Appellant does not address the Examiner's characterization of Konno's continuity checking in Fig. 5, but it is clear that the further characterization of what is "thus indicated" is completely factually incorrect.

Claim 24 also requires, using the computer system, constructing an N x M surface under the second N x M surface condition. The Examiner does not specifically address this limitation at all, but it is clear that nothing in the cited references teaches or suggests constructing any surface under any specific surface condition, and certainly not constructing on under an NxM surface condition that is converted from a Px1 surface condition.

Claim 24 also requires modifying the second N x M surface to edit a drawing. The cited references allow a drawing to be edited, but nothing in any combination of them teaches editing an NxM surface constructed under an NxM surface condition that was converted from a Px1 surface condition.

These rejections of claims 24 and 35 should be reversed, as should the rejections of dependent claims 25-29 and 36-40.

Claims 25 and 36

These claims include similar limitations, and may be considered together. Claim 25 requires that converting the P x 1 surface condition of the first surface into the second N x M surface condition further comprises generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface

and compatible with the number of first curves and the only one second curve that define the P x 1 surface condition.

The arguments of the respective parent claims apply here as well, and are hereby incorporated by reference.

As described above with regard to the independent claims, nothing in any combination of the cited references teaches or suggests the claimed NxM or Px1 surface conditions at all. They certainly don't teach or suggest converting the Px1 surface condition into the NxM surface condition, nor that it should be compatible with a specific curve that defines the Px1 surface condition.

The Examiner refers again to portions of Maya and Konno discussed above, but it is clear that they include no teaching, suggestion, or implication regarding the claimed surface conditions.

The rejections of these claims should be reversed.

Claims 26 and 37

These claims include similar limitations, and may be considered together. Claim 26 requires that converting the P x 1 surface condition of the first surface into the second N x M surface condition further comprises replacing the P x 1 surface condition with the second N x M surface condition.

The arguments of the respective parent claims apply here as well, and are hereby incorporated by reference.

As described above with regard to the independent claims, nothing in any combination of the cited references teaches or suggests the claimed NxM or Px1 surface conditions at all. They certainly don't teach or suggest replacing the Px1 surface condition with the NxM surface condition that was converted from it.

The Examiner refers again to portions of Maya reproduced above, but it is clear that they include no teaching, suggestion, or implication regarding the claimed surface conditions.

The rejections of these claims should be reversed.

Claims 27 and 38

These claims include similar limitations, and may be considered together. Claim 27 requires that converting the P x 1 surface condition of the first surface into the second N x M surface condition further comprises generating an N x M surface condition defined by the third and fourth curves such that the third and fourth curves are defined by mathematical equations all having an order no greater than mathematical equations defining the first and second curves.

The arguments of the respective parent claims apply here as well, and are hereby incorporated by reference.

As described above with regard to the independent claims, nothing in any combination of the cited references teaches or suggests the claimed NxM or Px1 surface conditions at all. They certainly don't teach or suggest the specific way to produce the NxM surface condition from the converted Px1 surface condition, as in these claims.

The Examiner refers again to portions of Maya reproduced above, but it is clear that they include no teaching, suggestion, or implication regarding the claimed surface conditions.

The rejections of these claims should be reversed.

Claims 28 and 39

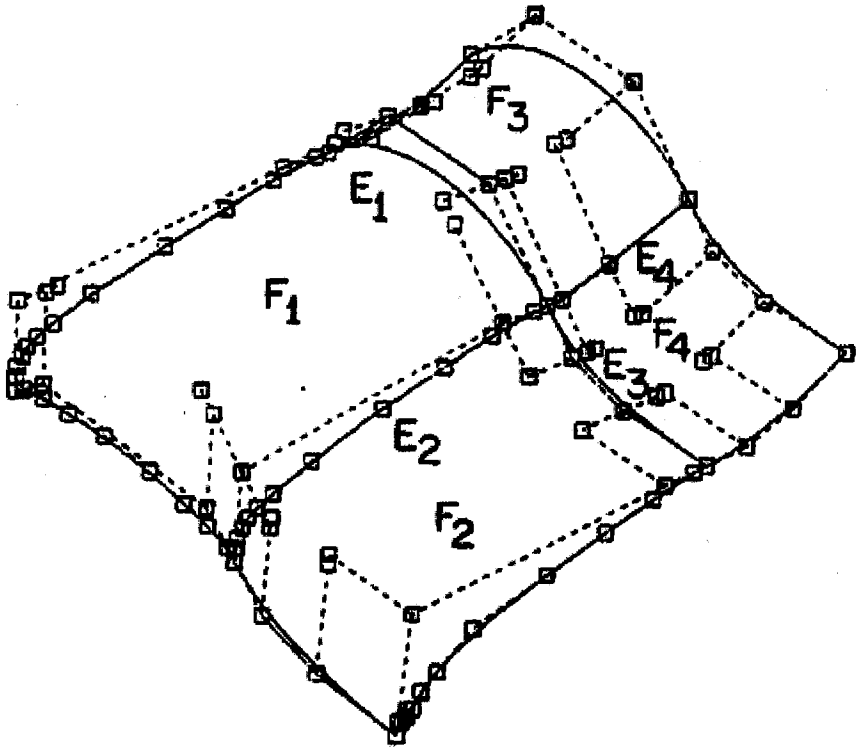
These claims include similar limitations, and may be considered together. Claim 28 requires processing the first curves and the second curve so that each one of the first curves and the second curve are compatible with each other of the first curves and the second curve.

The arguments of the respective parent claims apply here as well, and are hereby incorporated by reference.

As described above with regard to the independent claims, nothing in any combination of the cited references teaches or suggests the claimed NxM or Px1 surface conditions at all. They certainly don't teach or suggest this specific processing of each of the P first curves and the single second curve.

The Examiner refers to Konno at col. 11, lines 57-65 and Fig. 16, but it is clear that they include no teaching, suggestion, or implication regarding the claimed surface conditions. Konno depicts:

FIG. 16



Nothing in Fig. 16 is taught or suggested to be a surface having a Px1 surface condition, as this claim requires (in light of the respective parent claims). Konno describes:

> FIG. 16 shows curve mesh in which the general boundary Gregory patch, the Gregory patch, and the rational boundary Gregory patch are joined together. Edge E_1 is a quadratic rational Bezier curve, E_2 is a non-rational B-spline curve, E_3 and E_4 are Bezier curves. Thus, face F_1 is interpolated by a general boundary Gregory patch whose S^c is a rational function, and F_2 a general boundary Gregory patch whose S^c is a polynomial. And, face F_3 is interpolated by a Gregory patch, and face F_4 a rational boundary Gregory patch. *Konno, col. 11, lines 57-65*

The rejections of these claims should be reversed.

Claims 29 and 40

These claims include similar limitations, and may be considered together. Claim 29 requires editing the drawing, at least in part, by modifying additional surfaces having the first N x M surface condition of the second surface.

The arguments of the respective parent claims apply here as well, and are hereby incorporated by reference.

As described above with regard to the independent claims, nothing in any combination of the cited references teaches or suggests the claimed NxM or Px1 surface conditions at all. They certainly don't teach or suggest modifying additional surfaces having a specific NxM surface condition, as claimed.

The Examiner refers again to portions of Konno discussed above with relation to claim 28, but it is clear that Konno includes no teaching, suggestion, or implication regarding the claimed surface conditions. In fact, the Examiner appears to contradict herself by relying on Konno's Fig. 16 for both the claims Px1 surface condition and the claimed NxM surface condition.

The rejections of these claims should be reversed.

Claim 30

The arguments made above with regard to the claims 24 and 35 are incorporated by reference.

Claim 30 requires "using a computing system, determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than one".

As discussed above, these limitations are not taught by any combination of Maya and Konno. The Examiner refers to the same portions of Maya reproduced above, and it is clear that nothing in any of these cited portions, nor any other part of the cited art, teaches or suggests by using a computing system, determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than one. Claim 41 specifically requires a computer readable medium coupled to the computer system, the computer readable medium comprising a software program operable to determine that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition.

Except for one figure under "To add additional curves to a lofted surface", none of the figures cited by the Examiner show a surface at all, and there can be no teaching that any surface is determined to comprise any curves constituting any surface condition. Certainly, nothing in Maya describes at all if any surface in the system is defined by any specific surface condition. The Examiner merely refers to various of Maya's figures and assumes that some curves may be used to define some (unseen) surfaces, but does not show any teaching in Maya that any surface comprise any curves that constitute a specific surface condition.

The Examiner has made no showing at all that any surface is determined to comprise specific curves. The portions and figures indicated by the Examiner primarily concern adding curves to a wireframe (perhaps so a later surface could be generated), but not examining the surface conditions that define a given surface.

Since none of the cited references are concerned with identifying the various surface conditions that define the surfaces of a drawing, so that one or more of the surfaces can be replaced with surfaces having uniform surface conditions, it is clear that none of the references would address this specific limitation.

Claim 30 also requires, in response to determining that the plurality of curves constitute a P x 1 surface condition and using the computing system, converting the P x 1 surface condition into an N x M surface condition by generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface and compatible with the number of first curves and the only one second curve that define the P x 1 surface condition, the N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, wherein N and M are integers greater than one, wherein each of the third and fourth curves are of the same mathematical degree as the first and second curves to be compatible with the first and second curves.

First, as the prior "determining" step does not take place in the references, the references cannot teach that this step is performed *in response to* it.

The Examiner cites to the same portions of Maya reproduced above. The Examiner gives a lengthy discussion discussion regarding transform control and transformation, none of which is supported by the reference. Maya does not describe, at all, how any surface is defined by the system, whether by a Px1 surface condition, or an NxM surface condition, or otherwise. There is simply no such teaching, nor would there be in a user manual. As none of this information is described, there can be no implication that adding additional curves would determine any new surface having a specific surface condition. Nor do any other cited references include such a teaching. They certainly don't teach or suggest converting the Px1 surface condition into the NxM surface condition, nor that it should be done in a specific way to be compatible with a specific curve that defines the Px1 surface condition.

Claim 30 requires, using the computer system, constructing an N x M surface under the second N x M surface condition. The Examiner does not specifically address this limitation at all, but it is clear that nothing in the cited references teaches or suggests constructing any surface under any specific surface condition, and certainly not constructing on under an NxM surface condition that is converted from a Px1 surface condition.

Claim 30 also requires modifying the N x M surface to edit a drawing. The cited references allow a drawing to be edited, but nothing in any combination of them teaches editing an NxM surface constructed under an NxM surface condition that was converted from a Px1 surface condition.

These rejections of claim 30 should be reversed, as should the rejections of dependent claims 31-34.

Claim 31

Claim 31 requires that converting the P x 1 surface condition into the N x M surface condition further comprises replacing the P x 1 surface condition with the N x M surface condition.

The arguments of the parent claim apply here as well, and are hereby incorporated by reference. These limitations, and Examiner's rejections, are similar to those addressed above for claim 26, and the arguments above with respect to those claims are incorporated by reference.

The rejections of these claims should be reversed.

Claim 32

Claim 32 requires that converting the P x 1 surface condition into the N x M surface condition further comprises generating an N x M surface condition defined by the third and fourth curves such that the third and fourth curves are defined by mathematical equations all having an order no greater than mathematical equations defining the first and second curves.

The arguments of the parent claim apply here as well, and are hereby incorporated by reference. These limitations, and Examiner's rejections, are similar to those addressed above for claim 27, and the arguments above with respect to that claim are incorporated by reference.

The rejection of this claim should be reversed.

Claim 33

Claim 33 requires processing the first curves and the second curve so that each one of the first curves and the second curve are compatible with each other of the first curves and the second curve.

The arguments of the parent claim apply here as well, and are hereby incorporated by reference. These limitations, and Examiner's rejections, are similar to

those addressed above for claim 28, and the arguments above with respect to those claims are incorporated by reference.

The rejection of this claim should be reversed.

Claim 34

Claim 34 requires editing the drawing, at least in part, by modifying additional surfaces having the first N x M surface condition.

The arguments of the parent claim apply here as well, and are hereby incorporated by reference. These limitations, and Examiner's rejections, are similar to those addressed above for claim 29, and the arguments above with respect to those claims are incorporated by reference.

The rejections of these claims should be reversed.

Claim 41

These independent claims include similar limitations, and may be considered together. The arguments made above with regard to the claims 24 and 35 are incorporated by reference.

Appellant first respectfully notes that the Examiner doesn't address many limitations of this claim at all, but merely makes a circular reference that "the rationale for claim 41 is incorporated herein." There is no *prima facie* rejection of this claim.

Claim 41 requires "determine that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, the P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than one".

As discussed above, these limitations are not taught by any combination of Maya and Konno. Nothing in any of these cited portions, nor any other part of the cited art, teaches or suggests by using a computing system, determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than one. Claim 41 specifically requires a computer readable medium coupled to the computer system, the computer readable medium comprising a software program operable to determine that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition.

Certainly, nothing in Maya describes at all if any surface in the system is defined by any specific surface condition. The Examiner has made no showing at all that any surface is determined to comprise specific curves.

Since none of the cited references are concerned with identifying the various surface conditions that define the surfaces of a drawing, so that one or more of the surfaces can be replaced with surfaces having uniform surface conditions, it is clear that none of the references would address this specific limitation.

Claim 41 also convert the P x 1 surface condition of the first surface into a N x M surface condition, the N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, wherein N and M are integers greater than one, the third and fourth curves mathematically filling the space of the surface plane defined by the first curves and the only one second curve.

Maya does not describe, at all, how any surface is defined by the system, whether by a Px1 surface condition, or an NxM surface condition, or otherwise. There is simply no such teaching, nor would there be in a user manual. As none of this information is described, there can be no implication that adding additional curves would determine any new surface having a specific surface condition. Nor do any other cited references include such a teaching. They certainly don't teach or suggest converting the Px1 surface condition into the NxM surface condition, nor that it should be done in a specific way to be compatible with a specific curve that defines the Px1 surface condition.

Nothing in any reference addresses the limitation regarding "the third and fourth curves mathematically filling the space of the surface plane defined by the first curves and the only one second curve". The Examiner does not address this limitation of claim 41 at all, and there can be no proper rejection of claims 41-46.

Claim 41 requires, using the computer system, constructing an N x M surface under the second N x M surface condition. The Examiner does not specifically address this limitation at all, but it is clear that nothing in the cited references teaches or suggests constructing any surface under any specific surface condition, and certainly not constructing on under an NxM surface condition that is converted from a Px1 surface condition.

Claim 41 also requires the system to enable edits to the drawing, at least in part, by enabling modifications to the constructed N x M surface. The cited references allow a drawing to be edited, but nothing in any combination of them teaches editing an NxM surface constructed under an NxM surface condition that was converted from a Px1 surface condition.

These rejections of claim 41 should be reversed, as should the rejections of dependent claims 42-46.

Claim 42

Claim 42 requires that wherein the software program is further operable to convert the P x 1 surface condition of the first surface into the N x M surface condition by generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface and compatible with the number of first curves and the only one second curve that define the P x 1 surface condition.

The arguments of the parent claim apply here as well, and are hereby incorporated by reference. These limitations, and Examiner's rejections, are similar to those addressed above for claim 25 and 36, and the arguments above with respect to those claims are incorporated by reference.

The rejections of these claims should be reversed.

Claim 43

Claim 43 requires that the software program is further operable to convert the P x 1 surface condition of the first surface into the N x M surface condition by generating an N x M surface condition to replace the P x 1 surface condition.

The arguments of the parent claim apply here as well, and are hereby incorporated by reference. These limitations, and Examiner's rejections, are similar to

those addressed above for claim 26 and 37, and the arguments above with respect to those claims are incorporated by reference.

The rejections of these claims should be reversed.

Claim 44

Claim 44 requires that the software program is further operable to convert the P x 1 surface condition of the first surface into the N x M surface condition by generating an N x M surface condition defined by the third and fourth curves such that the third and fourth curves are defined by mathematical equations all having an order no greater than mathematical equations defining the first and second curves.

The arguments of the parent claim apply here as well, and are hereby incorporated by reference. These limitations, and Examiner's rejections, are similar to those addressed above for claim 27, and the arguments above with respect to that claim are incorporated by reference.

The rejections of these claims should be reversed.

Claims 45

Claim 45 requires processing the first curves and the second curve so that each one of the first curves and the second curve are compatible with each other of the first curves and the second curve.

The arguments of the parent claim apply here as well, and are hereby incorporated by reference. These limitations, and Examiner's rejections, are similar to those addressed above for claim 28 and 36, and the arguments above with respect to those claims are incorporated by reference.

The rejections of these claims should be reversed.

Claim 46

Claim 46 requires editing the drawing, at least in part, by modifying additional surfaces having the first N x M surface condition.

The arguments of the parent claim apply here as well, and are hereby incorporated by reference. These limitations, and Examiner's rejections, are similar to those addressed above for claim 29 and 40, and the arguments above with respect to those claims are incorporated by reference.

The rejections of these claims should be reversed.

Grouping of Claims

The claims on appeal do not stand or fall together, as may be seen from the arguments set forth below. Each claim or group of claims that has been argued separately under a separate subheading should be considered separately. While the appellant recognizes that a formal statement regarding the grouping of claims is no longer required, each claim should be considered separately; or at the very least each claim which is argued separately in the preceding sections of this brief should be considered separately.

REQUESTED RELIEF

The Board is respectfully requested to reverse the outstanding rejections and return this application to the Examiner for allowance.

Respectfully submitted,

December 15, 2009

Michael Wallace
Reg. No. 44,486
ATTORNEY FOR APPELLANT
Tel.: (770) 751-2351

Siemens Corporation
Intellectual Property Department
170 Wood Avenue South
Iselin, NJ 08830

APPENDIX A -
Claims Appendix

1-23. (Cancelled)

24. (Previously Presented) A method for interfacing with multiple surfaces within a computer-aided drawing environment, comprising:

using a computer system, determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than zero;

using the computer system, determining that a second surface of a drawing comprises a second plurality of curves constituting a first N x M surface condition, a first N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, wherein N and M are integers greater than one;

using the computer system, converting the P x 1 surface condition of the first surface into a second N x M surface condition to match the N x M surface

condition of the second surface, the second N x M surface condition being defined by a number of fifth curves equal to N and a number of sixth curves equal to M, wherein Nand M are integers greater than one;

using the computer system, constructing an N x M surface under the second N x M surface condition; and

modifying the second N x M surface to edit a drawing.

25. (Previously Presented) The method of Claim 24, wherein converting the P x 1 surface condition of the first surface into the second N x M surface condition further comprises generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface and compatible with the number of first curves and the only one second curve that define the P x 1 surface condition.

26. (Previously Presented) The method of Claim 24, wherein converting the P x 1 surface condition of the first surface into the second N x M surface condition further comprises replacing the P x 1 surface condition with the second N x M surface condition.

27. (Previously Presented) The method of Claim 24, wherein converting the P x 1 surface condition of the first surface into the second N x M surface condition further comprises generating an N x M surface condition defined by the third and fourth curves such that the third and fourth curves are defined by mathematical equations all having an order no greater than mathematical equations defining the first and second curves.

28. (Previously Presented) The method of Claim 24, and further comprising processing the first curves and the second curve so that each one of the first curves and the second curve are compatible with each other of the first curves and the second curve.

29. (Previously Presented) The method of Claim 24, and further comprising editing the drawing, at least in part, by modifying additional surfaces having the first N x M surface condition of the second surface.

30. (Previously Presented) A method for interfacing with a surface within a computer-aided drawing environment, comprising:

using a computing system, determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than one;

in response to determining that the plurality of curves constitute a P x 1 surface condition and using the computing system, converting the P x 1 surface condition into an N x M surface condition by generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface and compatible with the number of first curves and the only one second curve that define the P x 1 surface condition, the N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, wherein N and M are integers greater than one, wherein each of the third and fourth curves are of the same mathematical degree as the first and second curves to be compatible with the first and second curves;

using the computing system, constructing an N x M surface under the N x M surface condition; and

modifying the N x M surface to edit a drawing.

31. (Previously Presented) The method of Claim 30, wherein converting the P x 1 surface condition into the N x M surface condition further comprises replacing the P x 1 surface condition with the N x M surface condition.

32. (Previously Presented) The method of Claim 30, wherein converting the P x 1 surface condition into the N x M surface condition further comprises generating an N x M surface condition defined by the third and fourth curves such that the third and fourth curves are defined by mathematical equations all having an order no greater than mathematical equations defining the first and second curves.

33. (Previously Presented) The method of Claim 30, further comprising processing the first curves and the second curve so that each one of the first curves and the second curve are compatible with each other of the first curves and the second curve.

34. (Previously Presented) The method of Claim 30, further comprising editing the drawing, at least in part, by modifying additional surfaces having the first N x M surface condition.

35. (Previously Presented) An apparatus for interfacing with a surface within a computer-aided drawing environment, comprising:

a software program stored on a computer readable medium and operable, when executed on a processor, to:

determine that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, the P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than zero;

determine that a second surface of the drawing comprises a second plurality of curves constituting a first N x M surface condition, a first N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, wherein N and M are integers greater than one;

convert the P x 1 surface condition of the first surface into a second N x M surface condition to match the N x M surface condition of the second surface, the second N x M surface condition being defined by a number of fifth curves equal to N and a number of sixth curves equal to M, wherein N and M are integers greater than one;

generate an N x M surface under the second N x M surface condition;

and

modify the generated N x M surface.

36. (Previously Presented) The apparatus of Claim 35, wherein the software program is further operable to convert the P x 1 surface condition of the first surface into the second N x M surface condition by generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface and compatible with the number of first curves and the only one second curve that define the P x 1 surface condition.

37. (Previously Presented) The apparatus of Claim 35, wherein the software program is further operable to replace the P x 1 surface condition with the second N x M surface condition.

38. (Previously Presented) The apparatus of Claim 35, wherein the software program is further operable to convert the P x 1 surface condition of the first surface into the second N x M surface condition by generating an N x M surface condition defined

by the third and fourth curves such that the third and fourth curves are defined by mathematical equations all having an order no greater than mathematical equations defining the first and second curves.

39. (Previously Presented) The apparatus of Claim 35, wherein the software program is further operable to process the first curves and the second curve so that each one of the first curves and the second curve are compatible with each other of the first curves and the second curve.

40. (Previously Presented) The apparatus of Claim 35, wherein the software program is further operable to modify additional surfaces having the first N x M surface condition.

41. (Previously Presented) A system for interfacing with a surface within a computer-aided drawing environment, comprising:

a computer system having a display unit and an input device;

a computer readable medium coupled to the computer system, the computer readable medium comprising a software program operable to:

determine that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, the P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than one;

convert the P x 1 surface condition of the first surface into a N x M surface condition, the N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, wherein N and M are integers greater than one, the third and fourth curves mathematically filling the space of the surface plane defined by the first curves and the only one second curve;

construct an N x M surface under the N x M surface condition; and

enable edits to the drawing, at least in part, by enabling modifications to the constructed N x M surface.

42. (Previously Presented) The system of Claim 41, wherein the software program is further operable to convert the P x 1 surface condition of the first surface into the N x M surface condition by generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface and compatible

with the number of first curves and the only one second curve that define the P x 1 surface condition.

43. (Previously Presented) The system of Claim 41, wherein the software program is further operable to convert the P x 1 surface condition of the first surface into the N x M surface condition by generating an N x M surface condition to replace the P x 1 surface condition.

44. (Previously Presented) The system of Claim 41, wherein the software program is further operable to convert the P x 1 surface condition of the first surface into the N x M surface condition by generating an N x M surface condition defined by the third and fourth curves such that the third and fourth curves are defined by mathematical equations all having an order no greater than mathematical equations defining the first and second curves.

45. (Previously Presented) The system of Claim 41, wherein the software program is further operable to process the first curves and the second curve so that each one of the first curves and the second curve are compatible with each other of the first curves

and the second curve.

46. (Previously Presented) The system of Claim 41, wherein the software program is further operable to modify additional surfaces having the first N x M surface condition.

APPENDIX B -
Copy of Formal Drawings

APPENDIX C -
Evidence Appendix

Not Applicable -- No other evidence was entered.

APPENDIX D -
Related Proceedings Appendix

Not Applicable -- To the best knowledge and belief of the undersigned attorney, there are none.